

ABSTRACT

According to one exemplary embodiment, a heterojunction bipolar transistor comprises a base having a concentration of a first material at a first depth, where the first material impedes the diffusion of a base dopant. For example, the first material can be carbon and the base dopant can be boron. The first material also causes a change in band gap at the first depth in the base. According to this exemplary embodiment, the base further comprises a concentration of a second material, where the concentration of second material increases at the first depth so as to counteract the change in band gap. For example, the second material may be germanium. The concentration of the second material, for example, may increase at the first depth by amount required to cause a decrease in band gap to be substantially equal to the increase in band gap caused by concentration of the first material.